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RECENT DEVELOPMENTS IN SOVIET OPEN-PIT MINING

G. P. Yegurnov

The volume of overburden removed from open pits in the USSR was 2.5 times as great in 1950 as in 1945. Further development of the very effective non-transport method for removing overburden occurred simultaneously with the increase in the total volume of overburden removed. In 1950, removal of overburden by the nontransport method (one-bucket and multiple-bucket excavators) increased 3.3 million cubic meters, an 80-percent increase over 1945. In 1950, heavy one-bucket excavators operated on the banks of open pits, removing 40 million cubic tons of rock, about 70 percent of the entire amount of dumping work.

Electric-locomotive haulage is being introduced. In 1950, it accounted for the transport of more than 8 million cubic meters of rock. The productivity of one locomotive-drawn train per day was 475 cubic meters more in 1950 than in 1945.

Labor productivity in open-pit mining has increased 20 percent despite the fact that a number of pits have been converted to work deeper levels.

At present, coal pits employ the following methods for removing overburden and coal from open pits:

1. Railroad transport for overburden removal and belt conveyers to transport coal from the mine face to loading points at the surface (Korkinugol' and Volchanskugol' trusts and Khramtsovskiy Pit).
2. Railroad transport both for overburden removal and for the conveying of coal from the face to the surface (Karagandauglerazrez and Raychikhugol' trusts and Angren Pit).
3. A combined method whereby the upper rock benches are removed by railroad transport and the lower bench by the nontransport method; coal is transported from the mine face by belt conveyers (Vakhrushevugol' Trust).

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4. The nontransport method (one-bucket and multiple-bucket excavators and swing chutes) for overburden removal and railroad transport for the transport of coal (certain sections in the Raychikhugol' Trust pits).

Besides the above-mentioned methods, the hydraulic method, by which the overburden is reduced to a consistency that makes it possible to pump it out of the pit, is used in certain sections of some pits (Korkinugol', Vakhrushevugol', Volchanskugol', and Raychikhugol' trusts). The very effective method of transporting coal from the mine face by motor dump cars is only beginning to be introduced in the Kuzbass.

The following table indicates the method of transport used, the maximum depth of the coal pit, and the cost of removing one ton of coal, in percent. The cost of removing one ton of coal in the Angren Pit is taken as 100 percent.

<u>Names of Trusts and Pits</u>	<u>Transport Method</u>	<u>Max Depth of Pit (m)</u>	<u>Cost of Removing One Ton of Coal (%)</u>
Korkinugol'	Belt conveyer	180	154
Vakhrushevugol'		110	276
Volchanskugol'		80	173
Khramtsovskiy Pit		30	296
Karagandaugle- razrez		40	125
Raychikhugol'	Standard-gauge railroad trans- port	30	148
Angren Pit		45	100

Differences in the cost of operating by the belt-conveyer method are not to be explained by the depth of the pit, the toughness of the coal, or the thickness of the coal seam, but depend rather on work organization and the level of mechanization of the various phases of removing coal from the seam.

Rocks are removed from the coal directly from the conveyer-belt hoists in pits of the Vakhrushevugol' Trust because of the lack of sorting installations and central coal hoists. This is one factor which leads to an increase in the number of workers required to handle the conveying of coal and to load it onto railroad cars and makes the cost of loading one ton of coal onto a railroad car almost eight times as much in the Vakhrushevugol' Trust as in the Korkinugol' Trust.

A similar situation prevails regarding the transport of coal from the pits of the Volchanskugol' Trust. The coal seam being worked at the Khramtsovskiy Pit is of extremely complicated structure and the complete extraction of the coal is accompanied by great difficulties. This circumstance has led to a high cost for the production of one ton of coal and has presented an obstacle to a better organization of mining. The relatively low performance of the Raychikhugol' Trust pits results from unsatisfactory organization of mining operations in these pits.

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